Weatherwise

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40th Anniversary

VOLUME 12, NUMBER 6 · DECEMBER 1959

"SOME PEOPLE ARE WEATHERWISE BUT MOST ARE OTHERWISE"—BENJAMIN FRANKLIN

WEATHERWISE

THE MAGAZINE ABOUT WEATHER

DAVID M. LUDLUM, *Editor* HENRY W. BULKLEY, *Associate Editor*

40th Anniversary Meeting

THE American Meteorological Society will celebrate its 40th anniversary at a four-day meeting in Boston, Massachusetts from Tuesday, 19 January, to Friday, 22 January 1960. Technical sessions will be held on both mornings and afternoons of Tuesday, Wednesday, and Thursday, and on Friday morning. The Annual Business Meeting of the Society will take place on Friday afternoon and will feature the Presidential Address by Prof. Sverre Petterssen, as well as reports by the Secretary and the Treasurer.

Among the special events scheduled for the period will be an advanced showing of the new headquarters building, 45 Beacon Street, on Tuesday evening when members will be able to inspect the Society's new offices and working facilities which are to be occupied early in 1960.

At Honors Night, to be held Wednesday evening, the Society's awards will be presented. Prof. Sverre Petterssen will preside and an important address will be delivered by Dr. Lloyd V. Berkner, president, Associated Universities, Inc. His subject will be: "The Role of Meteorology among the Sciences."

The principal event of the meetings, the Anniversary Banquet, will be held in the Louis XIV Ballroom of the Somerset Hotel on Thursday evening. The major address will be given by Dr. Harold C. Urey, Nobel Laureate, of the University of California (La Jolla), entitled: "The Escape of Planetary Atmospheres."

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Secretary Charles F. Brooks, the leading spirit in the creation and growth of the American Meteorological Society, as he appeared at the age of 33 while attending an AMS meeting at Washington in January 1925.

The Society's First Quarter Century

THE LATE CHARLES F. BROOKS,
Blue Hill Observatory, Harvard University, Milton, Mass.

The following paper by the late Charles F. Brooks was presented on the occasion of the 25th Anniversary Meeting of the AMS at Kansas City in January 1945. The article is now reprinted as it appeared in *The Bulletin of the American Meteorological Society*, 25–5, May 1945, 163–170.

THE American Meteorological Society was organized at St. Louis 25 years ago. The formation of a society was considered feasible because of a large body of potential members: Signal Corps meteorologists to the number of several hundred in addition to Weather Bureau and other meteorologists and users or students of meteorology in bordering fields. The need for a private organization and for private publication in meteorology was indicated also by an ominous reduction in appropriations for the *Monthly Weather Review* beginning in 1919. The Government's *Review*, which, by its rise to the status of a well rounded journal, had been an important factor in the demise, in 1896, of the private *American Meteorological Journal* and its related New England Meteorological Society. So when and if the *Review* went into a decline, private enterprise should be ready to step into the breach.

The American Meteorological Society is now celebrating the successful completion of its first quarter century. At the 10th annual meeting we looked with pride on the first decade and felt sure of outlasting the 12 year age at which the old New England Meteorological Society died. As detailed in my report on "Our society's first decade" the preliminaries to the organization were:

(1) The need of aviators for a greater knowledge of meteorology so strongly

impressed my former Signal Corps student, Sgt. Perez W. Etkes (College Station, Tex., 1918) in the course of his duties as meteorological officer at Payne Field, Miss., that he attempted not only to aid them but also urged strenuously that "something *should* be done, to spread meteorology amongst the people."

(2) This led me to envisage a society of at least 100 members from among former Signal Corps meteorologists, Weather Bureau men and college and university teachers of meteorology, with dues of $1 "to cover postage and expenses of issuing a periodical leaflet containing items of interest, discussions, etc. which the *Mo. Wea. Rev.* would not normally print. . . . The Society could foster meteorological research." Sgt. Etkes urged higher dues and provision for local chapters.

(3) Encouraged by Chief C. F. Marvin and Dr. W. J. Humphreys at the Central Office, contacts were made by mail with Prof. R. DeC. Ward and Prof. W. M. Davis, leading men in the old *American Meteorological Journal* and New England Meteorological Society, who also definitely favored the formation of "a meteorological society to enable American meteorologists to get together and talk."

(4) On Aug. 22, I therefore, announced in *Science* "An American Meteorological Society is being formed and will be definitely organized at the A. A. A. S. meeting in St. Louis next December." Purposes were summarized and how they could be accomplished (by meetings and publication), the principal sources of membership were listed, and the need for moving now, to capitalize on the war-time developments as a foundation for great future needs. I asked for communications from prospective members, "in order to have a strong, tentative organization and working plans for the formal establishment of the society."

(5) Many hundreds of announcements were mailed in the fall (Figs. 1 and 2) to groups likely to include potential members: the former Signal Corps meteorologists, U. S. Weather Bureau officials, geographers and teachers of geography, physicists. As a result 586 persons had become members by the time the January, 1920, *Bulletin* went to press, and nearly as many more had indicated their desire to join—a fine start indeed.

(6) The final step was the framing of a tentative Constitution and By-Laws, which were patterned chiefly after those of the American Physical Society. The final, carefully considered document, which was the joint product of many persons, won ready acceptance at the well attended organization meeting, and the Society was born, with a rugged constitution, on Dec. 29, 1919. Immediate affiliation with the Am. Assn. for the Advancement of Science, assured a scientific standing from the beginning, and incorporation, through the legal efforts of R. H. Weightman, 3 weeks later, assured possibility of perpetuity.

The Society thus came into being through the combination of the interests and efforts of many and of a situation eminently ripe for such an organization. So embracing and continuing did its appeal prove to be to people very diversely interested in meteorology and its applications that the membership had a broad, lasting base in more than a score of different groups of people. These were listed in the first issue of the *Bulletin:*

"A little over half of its present membership of nearly 600 are amateur or professional meteorologists, while the rest comprise people with such diverse interests as those represented in the following groups: aeronautical engineers, architects, astronomers, automobile salesmen, aviators, business-men, civil engineers (especially dock and bridge builders), ecologists, explorers, farmers, fruit-growers, geographers, geologists, hydraulic engineers, lawyers, mariners, merchants, nature-lovers, newspaper men, officials in rail and auto-transportation, telephone, telegraph, light, and fuel companies, physicians, physicists, shippers, stockmen, students, and teachers. Surely, the applications of meteorology are manifold."

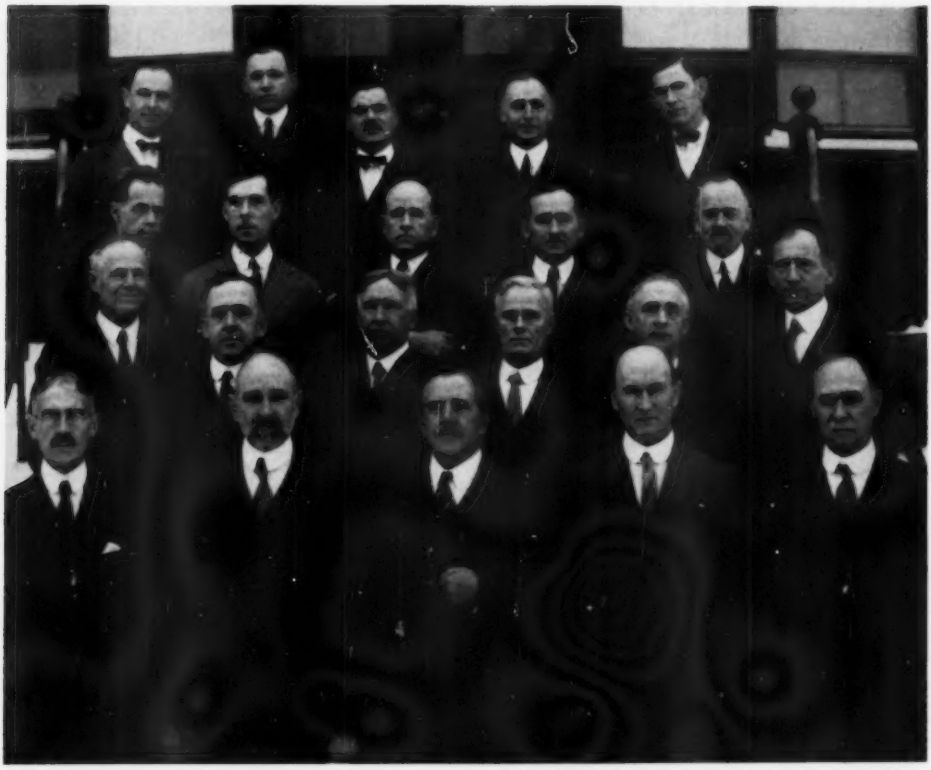
Thus there was stability, and the membership never fell below the 600 at the start; indeed, by the end of the first year, 1059 had applied for membership and 903 had paid their dues.

After 3 years at $1 dues, an increase to $2 was voted, and the Society began to lose marginal members. There was a decline of 152 in the next 3 years. After a low of 604 in 1927, the membership, stimulated apparently by the increasing applications of meteorology in aeronautics, increased to 690 at the end of

1929. In discussing the first 10 years (*Bulletin,* Jan., 1930, p. 12), I pointed to the establishment of not only the Meisinger Aerological Research Fund, but also the American Meteorological Society Endowment Fund, and to the awards of research grants from the income of the Life Membership Fund and contributions from interested members; and I concluded my summary with:

"At ten years of age the American Meteorological Society is talking meteorology, printing meteorology, and financing meteorology, taking its strength from a large and steady body of members of varied interests in all states and territories of the United States, the provinces of Canada, and most of the Latin American countries."

In 1936, John A. Riley, in assessing "Sixteen Years of American Meteorology and its Society" (*Bulletin,* Apr., 1936, pp. 95–100), noted that "Looking back through the file of *Bulletins,* one finds a steady growth from the notes and abstracts of early issues to the more important contributions of recent years." He also found that the "developments in meteorology since the organization of the American Meteorological Society are truly astonishing." Some of these developments he then proceeded to outline, with special attention to the story as told in the *Bulletin,* official organ of the Society. "While the growth of the Society has not kept pace with the development of meteorological services in the United States, the recent organization of local branches,



Officials and members of the AMS on the steps of the old Weather Bureau building at Washington in January 1925. Front row, left to right: Robert DeC. Ward, president 1919–21; Willis I. Milham, president 1924–25; Charles F. Marvin, president 1926–27; John Patterson, president 1930–31; William J. Humphreys, president 1928–29.

especially in the aviation centers of the country, appears to be bringing meteorology to the attention of an increasing circle of business and professional men who are finding the subject important in their work; in this way these branches are promoting a healthy growth of the Society."

Speaking of the first 20 years of the Society (*Bulletin*, Jan., 1940, pp. 26–27), I pointed to the growth of the *Bulletin*, from 152 pages the first year to 254 the tenth, and 458 the 20th, a size it has since held approximately, and to the gradual addition of illustrations. To 27 meeting the 1st decade, 38 were added in the second, and 18 more in the last 5 years, making a total of 83 meetings in the 25 years. This is the 84th meeting of the Society.

The publications of the Society have been: the *Bulletin*, 25 volumes, which in bound form occupy 28 inches of shelf space; "Snow Crystals," a beautiful book by W. A. Bentley and W. J. Humphreys (out of print); "Introduction to Air Mass and Isentropic Analysis," by J. Namias, and others, edited by R. G. Stone (5 editions, totalling about 20,000 copies); and the Atmospheric Radiation Chart, by W. M. Elsasser.

The Book Service of the Society was inaugurated by Mr. and Mrs. R. W. Burhoe as an outgrowth of the arrangement the Society had from the beginning to subscribe for the *Monthly Weather Review* for those members wanting it, and, later, for sending copies of the monograph series of various university meteorological departments. The need for it immediately became apparent in the large business that has come in. The Book Service is definitely furthering the basic aims of the Society by making published meteorological knowledge more readily available to members.

The Society has maintained an informal consultation from the beginning and a growing library service from many years back.

The growth of the endowment of the Society has come from several sources. Mention has already been made of the Life Membership Fund, which has received the life membership contributions of the 50 or 60 members who wished thereby to be relieved of annual payments. The Meisinger Aerological Research Fund was subscribed by a great many members. The American Meteorological Society Endowment Fund came from occasional donations of Mr. Henry S. Shaw. The Edson Fund was established by the sisters, Miss Margaret and Miss Mary Edson, on behalf of their deceased brother, Dr. Corrall E. Edson, The Jardine Fund was established by the gift of $4000 in bonds by Dr. Robert E. Horton, who wished to perpetuate the inspirational value of the life and work of Dr. Mary Jardine Evans by promoting research and publication in medical climatology, meteorology and hydrology. These funds, and others like them that may be created from time to time, provide for the stimulation of research through an award or through helping with the expense of the research itself or its publication. The Society has its funds in conservative securities managed by a large and highly regarded trust company.

The annual budget of the Society ranged between $1,400 and $2,000 during the first 11 years, and from $2,000 to $2,300 the next four years, keeping low during the period when the membership was mostly between 600 and 800 and the *Bulletin* under some 300 pages, requiring little paid assistance for the Secretary and Treasurer, who served without compensation. But when the membership began to move into a distinctly higher level, clerical and editorial expenses had to mount much more than in proportion, for the work of the Society could no longer be handled largely on spare time by officers on regular full-time jobs. An editor had to be appointed. The *Bulletin* continued to grow, to provide for the publication of more and more research. Unfortunately, funds were not sufficient to cover both research papers and the large quantity of interesting miscellaneous material of which only a minor part could be published after the research papers and reviews had been taken care of. The budget rose from $2,100 in 1934 to $5,300 in 1939, when the dues were increased to $3. With a further increase to $3.50 in 1941 the budget reached $6,000. Since then, under wartime increases of membership and services and increases in costs, the budget has gone up rapidly to $14,000. The following tables gives the picture of membership, *Bulletin* subscribers and annual budgets through the first 25 years.

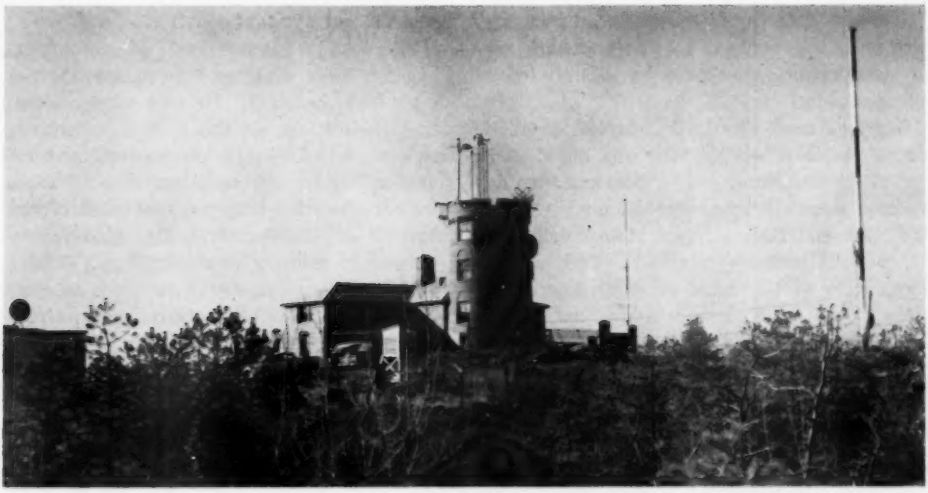
A distinguished group of presidents have contributed to the development of the Society.

Prof. Robert DeCourcy Ward, our first president, 1920 and 1921, set a standard for presiding officers that has not since been excelled. He conducted meetings with dignity and dispatch, never allowing a speaker to impose on the audience by exceeding his allotted time, yet encouraging discussion and with well chosen words assessing the importance of a paper, expressing the appreciation of the group. His first presidential address, "Climate and Health, with special reference to the United States," brought attention to important effects of different climates on health and urged far more climatological instruction in the medical schools of the U. S. In his second presidential address, "Some tendencies in climate during the past decade" were summarized: (1) increased emphasis on practical climate in its almost infinite variety, especially on quantitative evaluations; (2) variabilities, frequencies, probabilities; (3) weather as essential to a proper understanding of climate; (4) importance of homogeneity of records.

Sir Frederick Stupart, our second president, 1922 and 1923, is remembered for his graciousness as presiding officer and for the felicity and interesting character of his remarks. His presidential address, delivered at Cambridge, was on the "Meteorological stations in high latitudes," a subject of particular concern to him as head of the Canadian weather service, and of outstanding interest to American meteorologists. A long discussion followed. His presidency made the liaison between Canadian and U. S. meteorologists still closer.

Sir Frederick's second presidential address, at the Cincinnati meeting, in Dec., 1923, covered the "History of meteorology in North America since 1848," a history in which he had played a leading role with respect to the Canadian portion during the last half century. He indicated the importance of far flung networks of stations and cited examples of remarkable seasonal abnormalities and urged detailed study of them.

Professor Willis I. Milham, of Williams College, the third president, 1924 and 1925, agreed with Sir Frederick, and chose for his presidential address: "The year 1816—the causes of abnormalities." His facts were taken chiefly from the Williams College instrumental record of the weather, and his consideration of the causes was thorough. Prof. Milham's address was a masterpiece of



Blue Hill Observatory of Harvard University atop Blue Hill in Milton, Massachusetts, just south of Boston, where Dr. Brooks and his associates conducted many of the affairs of the AMS from 1931 until his untimely death in 1958. Photo courtesy of John Conover.

Growth of the American Meteorological Society

(Compiled by R. W. Burhoe, E. M. Brooks and C. F. Brooks)

Year	Member-ship	Bull. subscriptions	Pages in Bulletin	National meetings	Active branches	Annual expense	Endow-ment
1919	586	0	0	1	0	$190	0
1920	903	7	184	3	0	1767	$730
1921	756	0	148	2	0	1595	955
1922	772	0	182	3	0	2041	1170
1923	713	0	180	3	0	1693	1170
1924	661	63	182	3	0	1701	1699
1925	620	56	193	3	0	1709	2368
1926	637	68	175	2	0	1404	2639
1927	604	54	194	2	0	1542	2839
1928	662	67	220	3	0	1767	4890
1929	690	78	254	3	1	1898	4959
1930	761	127	224	3	1	1940	5309
1931	771	126	230	3	1	2190	6391
1932	752	110	248	3	1	2248	6476
1933	694	116	311	4	2	2049	6563
1934	744	111	318	3	3	2084	6574
1935	844	130	334	4	6	2716	6677
1936	888	150	402	5	6	3535	6665
1937	964	172	420	3	7	4320	9534
1938	1131	260	472	4	8	4793	11672
1939	1189	561	458	6	15	6281	12752
1940	1164	539	438	4	17	5158	14452
1941	1400	939	430	6	14	5960	14552
1942	1521	671	430	3	9	7390	20727
1943	1602	525	398	4	8	10765	22007
1944	2286	1363	342	2	10	14227	22568

organization and presentation, continuing the high standard set by his predecessors. Prof. Milham's clear and conservative counsels benefited the Society not only during his presidency but throughout his several terms as Councilor.

The late Prof. Charles F. Marvin, Chief of the U. S. Weather Bureau, was our fourth president, 1926 and 1927. His presidential address was "On measurements of the solar radiation and their interpretation," delivered at the Philadelphia meeting. This was a recognition of the value of daily determinations of the solar constant and a critique of instrumentation for the purpose, with proposals for a better form of pyrheliometer and improved techniques for reducing the variable effect of the atmosphere.

Professor Marvin had from the beginnings of the move to form a Society taken a keen interest and had benefited our organization time and again by his active participation in all affairs of the Society.

The meeting at Nashville, under the second year of his presidency, was an outstanding scientific and social affair.

Dr. W. J. Humphreys, Meteorological Physicist, U. S. Weather Bureau, was the Society's fifth president. He took a very active part in all affairs of the Society during its first two decades. His own papers and his trenchant and sparkling discussions of those of others greatly enhanced the value of the meetings of the Society. Dr. Humphreys' presidential address, "Meteorology's frozen assets," delivered at the New York meeting in Dec., 1928, was not only thought provoking, but resulted in the Society's receiving a gift from Mr. Henry S. Shaw to thaw out one of these frozen assets. Dr. Humphreys was thereby enabled to get Mr. W. A. Bentley to pick out about 2000 of his best microphotographs of snow crystals for publication under the joint authorship of Dr. Humphreys and Mr. Bentley, as "Snow crystals," sponsored by the Society. Dr. Humphreys' second

presidential address, delivered at the Des Moines meeting, Dec., 1929, was on "The structure of the atmosphere," to the knowledge of which he had personally been an important contributor.

John Patterson, M.A., Physicist, Meteorological Service of Canada, Toronto, was our sixth (and second Canadian) president, 1930 and 1931. His presidential address was on "Airship meteorology," delivered at the Cleveland, Ohio, meeting Dec. 29, 1930. This subject was much to the fore at that time, with the development of transatlantic travel in large dirigibles. Though, on account of official duties, President Patterson could not attend the following annual meeting (in New Orleans), he actively participated in the government of the Society throughout his two years in office and subsequently; and the influence of the Society in Canadian meteorology increased.

The late Dr. Herbert Harvey Kimball, Meteorologist in Charge of Solar Radiation Investigations, U. S. Weather Bureau, was the Society's seventh president, 1932 and 1933. His presidential address, at the Atlantic City meeting, Dec. 27, 1932, was on "Recent advances in the science of meteorology and in its practical applications." Though Dr. Kimball did not give a second presidential address he presented several papers at the Chicago and Cambridge meetings in 1933: the most important of which was his opening address in a symposium at Chicago on "Radiation and the general circulation of the atmosphere."

Isaac Monroe Cline, M.D., Ph.D., U. S. Weather Bureau, New Orleans, La., was our eighth president, 1934 and 1935. Dr. Cline delivered as his presidential address "A century of progress in the study of cyclones," Pittsburgh, Pa., Dec. 29, 1934. With eminent fairness, in a sweeping, comprehensive survey, Dr. Cline summarized the contributions of the numerous investigators who have made significant additions to our knowledge of the nature of cyclones. He devoted especial attention to the tropical cyclone, on which he is an authority. The Society benefited from Dr. Cline's presidency also through his keen interest and practical advice.

Joseph Burton Kincer, Principal Meteorologist, in charge of the Division of Climate and Crop Weather, U. S. Weather Bureau, Washington, D. C., was the ninth president, 1936 and 1937. "The national loss from hail, windstorms, drought, and other weather vagaries," was the subject of Mr. Kincer's presidential address at the Atlantic City meeting, Dec. 29, 1936. In the Feb., 1937, *Bulletin*, President Kincer inaugurated a new department, on the monthly weather, a page or two summarizing the outstanding features in the United States. In successive *Bulletins* the weather of January, February, and March and April was interestingly presented by Mr. Kincer or Mr. R. J. Martin; but thereafter, the irregularity of publication of the *Bulletin* (esp. two summer months omitted) rendered this interesting weather feature impracticable.

Willis Ray Gregg, Chief, U. S. Weather Bureau, elected (tenth) president for 1938 and 1939, unfortunately died in office, in September, 1938. As Treasurer for many years, and in the short time he was president, he played a notable role in building a strong Society. He had planned for his presidential address a look ahead for 50 years, and had written to several members of the Society to get their viewpoints. The replies were edited by the late W. C. Devereaux, and presented at the Richmond, Va., meeting in Dec., 1938.

Dr. Robert E. Horton, appointed by the Council to fill the unexpired portion of Mr. Gregg's term, became the eleventh president. He, too, had been Treasurer, and had taken an active and potent interest in the Society from the beginning. Dr. Horton's presidential address, "What can we do about the weather?" presented at the Richmond meeting, Dec. 27, 1938, was the challenge of an eminent engineer to meteorologists to extend the applications of their science more fully to human affairs. After his term as president was over, Dr. Horton continued active as a councilor. His clear thinking and advice have been invaluable to the Society ever since.

Dr. Francis W. Reichelderfer, Chief, U. S. Weather Bureau, was the twelfth president, 1940 and 1941. His presidential address was on "Technical progress and the professional consultant in meteorology," presented at Philadelphia, Dec. 30, 1940. Dr. Reichelderfer tried to draw the limits of the spheres of Government and private activity in meteorology under the difficult limitations of wartime. In spite of the great pressure of his

duties in the rapidly expanding work of the Weather Bureau, Dr. Reichelderfer devoted much helpful attention to all problems of the Society, not only during his presidency but also before and since.

Major Edward Hall Bowie, M.S., Principal Meteorologist, in Charge, U. S. Weather Bureau, San Francisco, Calif., became the thirteenth president, for 1942 and 1943. Unable to make the trip to New York, in Jan. 1943, he sent his presidential address to be read: without formal title, the subject was on "the part that our Society is under obligation to take to advance the science of meteorology and aid those associated with it in a professional or nonprofessional capacity." To emphasize present needs and opportunities, he detailed the history of an earlier, abortive attempt to establish a full fledged journal and society, and some of the circumstances surrounding the organization and early history of the American Meteorological Society. He urged greater activity toward getting all professional meteorologists interested in the Society for the common effort to advance the science. Though he died in July, his successor, Dr. Bernhard Haurwitz, as Acting President for the remainder of the year, was able to motivate the development of professional interest in the Society by nominating a Ways and Means Committee.

Dr. Carl-Gustaf Arvid Rossby, our fourteenth president, for 1944 and 1945, has taken a very active part in carrying out and enlarging upon the recommendations of the Ways and Means Committee, to establish a professional group within the Society and a technical journal. Largely through his efforts, the value of the Society has been brought effectively to the attention of hundreds of potential professional members and to a number of corporation members; and he developed a practicable scheme for establishing the new *Journal of Meteorology*.

Our respected Secretary, the late Charles F. Brooks, as he appeared at the age of 62 in May 1953 while addressing an AMS meeting in Washington, D. C.

The American Meteorological Society 1944–59

DAVID M. LUDLUM

The late Charles F. Brooks had planned to continue his history of the AMS and to publish a definitive version in *Weatherwise*. To bring his account up-to-date, the following material has been extracted from the reports of officials of the Society and arranged in what seems a logical sequence in order to tell the story of the past 15 years' accomplishments. It is hoped that a complete history can be prepared for the 50th Anniversary in 1969. Members who have manuscript material, photographs, or memorabilia of the AMS are requested to communicate with the Executive Secretary. A permanent display of historical material concerning meteorology is planned for the new headquarters building.

REORGANIZATION 1944–46

THE tremendous expansion of scientific activity attendant the years of World War II brought unprecedented problems to scientific societies. Probably no science experienced a greater increase in tempo than did meteorology. The demands of global war required a world-wide knowledge of surface weather conditions, and on top of this the emphasis on air power created an immediate need for the solution of atmospheric problems at all levels.

The inadequacy of the publication program of the AMS to meet the new needs quickly became apparent. The subject, which received considerable attention during 1943, resulted in a decision at the 8 November 1943 meeting of the Council to expand the *Bulletin* by the inclusion of new matter and to publish several special issues to assist the war training program. At a meeting on 29 November 1943 a further step was taken when the Council to submit to the members of the Society the question of having two publications, the *Bulletin* and a new magazine, the latter to be devoted to technical articles at a professional level.

The question naturally arose as to who was going to support the new technical publication. Accordingly, the Council at a meeting on 27 January 1944 voted "to institute a professional grade of membership that requires certain minimum professional attainments in meteorology." With this important decision made, a Ways and Means Committee, suggested in part by Acting-President Haurwitz, was appointed to recommend to the spring meeting "how the professional grade should be elected, and any other changes in the structure of the Society and its publications that appear desirable to enable the Society to meet in full the post-war problems in meteorology that should normally interest a professional society." Professor Henry G. Houghton of M.I.T. became chairman of this "reorganizing" group which also included representatives of the major meteorological universities, the airlines, Weather Bureau, Army Air Force, Navy, amateurs, research, and journalism.

In "A message to the members from President Rossby," which appeared in the June 1944 *Bulletin*, the new President announced these important decisions and explained his forward-looking program. He pointed out:

"Those of us who, because of our opportunities in the past, are most concerned with the responsibility for the future of American meteorology feel very strongly that the best or only opportunity to create a strong professional organization lies in the expansion and transformation of the American Meteorological Society into an organization capable of serving the interests of both professionals and interested laymen alike."

President Rossby went on to lay down a ten point program that would provide for the maintenance of high professional and ethical standards among meteorologists, would provide a maximum number of positions for

Prof. Carl-Gustaf A. Rossby, president 1944–45, and Prof. Henry G. Houghton, president 1946–47—both were leaders in transforming the AMS into a society capable of serving both professionals and laymen.

returning military meteorologists in this and associated fields, and would supply a formula in which both Government and individual meteorologists could work in harmony for the advancement of the science as a whole.

The first results of the reorganization plan were soon in evidence. On 3 June 1944, Thomas B. Marshall of Chicago was appointed to fill the post of temporary Executive Secretary until September, "it being understood that this appointment carries no financial obligation on the part of the Society." Mr. Marshall's principal task entailed a membership drive. Although the Ways and Means Committee reported at the same session, formal consideration of its recommendations was postponed to a meeting on 17 June 1944 at Chicago, attended by President Rossby, Secretary Brooks, and Councilor Byers—telephone conversations were held with Councilors Reichelderfer, Stone, Wexler, and Horton.

At this unusual session the report of the Ways and Means Committee was accepted with several minor changes in terminology. Thus the die was cast, if the membership approved, to reorganize into a porfessional society. The report of Prof. Houghton's committee called for changes under four main headings: (1) Grades of Membership—there would be two main types of membership: professional and associate or regular. (2) Organization—the office of executive secretary would be created with the employment of a full-time officer who "would be responsible to the president for carrying out the organized activities of the Society." An important function of this office would be the compila-

tion and maintenance of a personnel file on all members and the direction of a placement service for those seeking employment in the field. (3) Publications—two serial publications were authorized: the *Bulletin* and a new technical journal "to be issued by volume with no fixed date of publication." An editorial committee would conduct the new journal with the assistance of a system of referees to consider the quality of submitted papers. (4) Dues of regular members were not to exceed $4 and professional members $10.

At a follow-up meeting on 10 July 1944 in Washington the report of the Ways and Means Committee received final approval with several minor changes and the committee discharged. The new technical journal was formally authorized at this meeting, and a 60-day drive for new members, principally among the Armed Forces, initiated. The committee to draft changes in the constitution, appointed at the recent Chicago meeting, reported with a draft of the machinery to put the reorganization into effect. It was decided to submit the proposed new constitution and by-laws to the membership on a referendum ballot. This was done on the regular election ballot which reached the mails on 15–16 December 1944.

At the 25th Anniversary Meeting at Kansas City, 24–25 January 1945, the tellers reported that the new constitution had won approval by a vote of 1021 to 65. At the same time the Council formally approved the revised constitution and by-laws, and urged the membership to accept them. The new constitution was published for the first time in the February 1945 *Bulletin*.

The reorganization period of the Society spanned President Rossby's term of office from January 1944 to January 1946. In a summing up of his service, Rossby appraised the promises he had made two years earlier. 1. Professional organization was achieved. 2. The AMS was the voice of American meteorology. 3. A professional journal had been established. 4. Interest had been stimulated among boundary sciences. 5. In Industrial Meteorology "some interest had been aroused." 6. A permanent Executive Secretary Office, though not yet in being, was about to be established. 7. Fund Raising—$11,000 in hand. 8. Corporation memberships—"50 wanted; 21 gotten." With this summation of his far-sighted leadership in office during this historic period of the AMS, President Rossby turned the reigns over to his able successor, Prof. Henry G. Houghton of M.I.T.

Membership

Secretary Brooks took the occasion of the 25th Anniversary Meeting in January 1945 to make a forecast as to the status of membership in the Society at the end of its second 25 years, in 1970. He foresaw that professional members would number at least 2,000; corporation members at least 100; regular members about 5,000; and associates about 10,000.

Let us see how this forecast has fared for the first 15 years of the period. At the conclusion of 1945 the total membership in the Society numbered 2,883. At the end of 1948 the figure first exceeded 3,000; not until 1953 did it pass 4,000; in 1954 the total reached over 5,000; and in 1958 surpassed 6,000. At the end of 1959 total membership will be about 6,800.

Professional membership has increased from 1,179 in 1945 to 3,120 in 1959. Regular membership, which totaled 1,704 in 1945, has now reached 2,070. The associate membership, instituted in 1952, now numbers 1,240. Corporate membership multiplied from 21 in 1945 to the present figure of 72. It can readily be seen that Dr. Brooks' forecast has already been exceeded in the professional ranks; closely approached in the corporate category; but it is still far from fulfillment in the regular and associate classes.

The Society has taken care to insure quality among its membership as well as quantity. The Committee on Admissions labors many long hours each year to screen the background of applicants for professional membership and are the unsung heroes of the Society in that their work receives little notice or acclaim. Another committee, that on Professional Ethics and Standards, keeps an eye on the conduct of members and has the unpleasant task of chastising a member for questionable activities, though fortunately cases of this type have been most infrequent in the 15-year history of the professional Society.

Meetings

The meetings of the Society are held in various parts of the country for the exchange of ideas through the presentation of formal papers, audience discussions, and private personal conversation. About a dozen meetings and conferences have been sponsored by the AMS each year at various locations throughout the country, and often the meetings were held in conjunction with other groups with an interest in meteorology such as the Air Pollution Control Association, American Association for the Advancement of Science, American Geophysical Union, American Rocket Society, American Society of Civil Engineers, Federation of American Societies for Experimental Biology, Institute of Aeronautical Sciences, and Instrument Society of America.

Two meetings of international scope were held with the Royal Meteorological Society (Toronto 1953) and with Scandinavian geophysical societies to celebrate the 40th Anniversary of the Polar Front Theory (Bergen, Norway, 1958).

The breadth of the present activities of the AMS may best be illustrated by an enumeration of the meetings and conferences scheduled for 1959–60. In addition to the regular meetings, special conferences will take place on: Weather Modification, Stratospheric Meteorology, Fluid and Solid Mechanics (in conjunction with 11 other technical societies), Applied Meteorology, Weather Radar, High Atmosphere, Instrumentation, Agricultural Meteorology, and Severe Storms.

To supplement the annual schedule of national meetings, there is great activity at the grass-roots level where 61 Local Branches of the Society hold regular meetings throughout the year for scientific discussion and informal social gatherings. Local branches often serve as hosts for national meetings and conferences. In 1959 there were local branches in 31 states, two in Germany, and one each in

A group of prominent meteorologists and past officials of the AMS. From left to right: Mr. Henry DeC. Ward, treasurer 1947—; Dr. Robert D. Fletcher, president 1956–57; Prof. Henry G. Houghton, president 1946–47; the late Dr. Charles F. Brooks, secretary 1919–54; Capt. Howard T. Orville, president 1948–49; Dr. Francis W. Reichelderfer, president 1940–41; and Prof. Horace R. Byers, president 1952–53.

England, Bermuda, Puerto Rico, Azores, Spain, and Japan.

Finances

In 1943, the last full year of limited operations under the old Constitution, without an executive office and with only one publication, the total expenses of the Society exceeded $10,000 for the first time in its 24-year existence, the figure having been below $5,000 for every year prior to 1939.

In 1944, the balance sheet of the Society showed a general income of $16,000, special gifts of $10,000, and total expenses of only $14,200. The principal of the endowment stood at $22,500; total assets amounted to $41,600. Certainly, the Society was in excellent financial shape for the scope of activities carried on.

The first post-war year of 1946, when the Office of the Executive Secretary was permanently established and the headquarters opened in Boston, saw a large increase in both expenses and income, receipts jumping to $37,000 and expenses to $40,600. Much of the income, however, came from special gifts which totaled about $17,000 in 1944–46 and were earmarked for the creation of an effective working organization so that the Society could play the role which the reorganizers had envisioned. It is quite apparent that without these special gifts the larger scope of the Society's affairs could not have been achieved.

This marked the first post-war crisis in the financial affairs of the Society. Treasurer Burhoe, who had labored long and faithfully for the Society during the difficult war years, disapproved of the situation in which outgo exceeded income and submitted his resignation on 10 February 1947. Henry DeCourcey Ward, the son of the first president of the AMS and a member of Eaton & Howard of Boston, became treasurer. Time was working in favor of the Society, however, and his first report for the year 1947 did not justify the pessimism of his predecessor. Income from dues and sale of publications increased, while the consolidation of the secretary's and treasurer's offices into the headquarters decreased expenses over the previous year. It should be mentioned that David F. Landrigan has served the Society as both auditor and legal counsel from 1945 to the present and has steered the Society's financial ship between many lows and highs along as smooth financial contours as the situation would permit.

In 1949 a second crisis threatened so a special committee of the Council investigated the affairs of the Society in view of a prospective deficit for the coming year. It was found that publication costs had risen from $14,000 in 1946 to $31,500 in 1949, partly as a result of the post-war inflation and partly from the greatly expanded publication program. For instance, the cost per page of the *Bulletin* increased from $17.10 in 1948 (old format) to $32.50 in 1949 (new format). It was decided to decrease the number of pages to be published in the *Bulletin* and the *Journal* in 1950 and to discontinue the free distribution of *Weatherwise* until income could justify its restoration. Time, again, was working in favor of the Society as increased receipts soon put the publication program back to a normal basis.

The business face of the Society entered a new phase in 1949 when it was called on by the U. S. Air Force to administer two large publishing ventures: the *Compendium of Meterology* and the *Meteorological Abstracts and Bibliography*. The Society already had the facilities in being to commence these enterprises without loss of time, and their products were soon in the hands of research workers. The annual income of the Society, which stood at $49,000 in 1948, increased almost annually to a figure of $365,000 in 1958, the last full year for which figures are available.

The dues picture also illustrates the pace at which the Society was growing. In 1944 the $9,000 received from dues represented about 40% of total income. By 1958, dues totaled $77,000 or about 21% of total income. During the same time the cost of publishing the Society's magazines rose from $7,500 to the current figure in excess of $100,000.

Office of the Executive Secretary

The planners of the reorganized Society envisioned the Office of the Executive Secretary as the key to the successful carrying out of the greatly expanded scientific and professional activities of the Society, for here would be an individual and staff whose full time would be devoted to furthering the interests of the Society and the science of meteorology

Major General Donald N. Yates, U.S.A.F., president 1950–51. Gen. Yates is currently Commanding Officer, Patrick Air Force Base, Cape Canaveral, Florida.

as a whole. During 1944–45 three individuals, Thomas R. Marshall, Ferguson Hall, and Charles Bates, more or less carried on the functions of the office.

By early 1946 funds were at hand, thanks to generous gifts by the Daniel and Florence Guggenheim Foundation, the Friez Division of the Bendix Aviation Corporation, and United Airlines to establish the office on a permanent footing. The appointment of Lt. Col. Kenneth C. Spengler was approved by the Council, and he assumed his duties on 1 April 1946. Offices were established at 5 Joy Street, Boston, Massachusetts. Miss Frances Day, now Mrs. Holt Ashley, who had been Dr. Rossby's secretary in Chicago, moved to Boston to supply much-needed continuity for Society matters.

In the immediate post-war years the Office of the Executive Secretary, with a staff which totaled five members at the end of 1946, concentrated on the most pressing problem of its members—employment. A complete card-index file on each member was created so that up-to-date data would be immediately available. Through the Employment Service many returning military meteorologists and those who were taking higher degrees were brought into contact with prospective employers.

In the related field of guidance, the Office supplied educational officers in many schools and colleges with pertinent information. In 1947 a new publication, *Weather Horizons,* was composed and over 10,000 copies distributed without charge through guidance channels. Currently hundreds of inquiries are received daily by the Society. The extent of guidance activity is so large that a suite of rooms will be devoted exclusively to guidance affairs. A *Directory to Membership* appeared in 1948 to assist members in locating former associates and to facilitate communication between members.

After the most pressing reemployment problems were met, the emphasis of activity shifted to the expansion of the Society's publications and the performance of services pertinent to the development of the science and profession. The unique position of the Society in the publishing field made it a natural choice when the research requirements of the U. S. Air Force needed new channels for the dissemination of meteorological information. The work on the *Compendium of Meteorology* and the *Meteorological Abstracts,* which will be discussed in more detail later, commenced in 1948–49, and greatly enlarged the scope of the headquarter's activities.

An important function of the Office has been to keep members in all parts of the country and abroad in touch with developments and activities in meteorology. Newsnotes and announcements in the *Bulletin* have served as a sort of newsletter to members, and thousands of personal letters have answered more particular inquiries. A sense of personal contact with the Society has been brought to many members by the attendance of the Executive Secretary at many national meetings, branch sessions, and informal get-togethers. Also many valuable contacts for the Society have been cemented by visits to business and industrial companies with a concern in meteorology, and countless branches of the Government have been able to discuss their meteorological problems face-to-face with a representative of the Society. The encouragement and guidance of Branch Chapters has been a very worthwhile concern of the

Office—in 1945 there were 10 active branches while in 1959 the number totaled 61.

The supervision of the production of Society's publications has always been a prime responsibility of the Office. Since 1954 all material except technical articles for the *Journal* has been prepared for the press at the Boston headquarters, and in 1957 an assistant to the editor of the *Journal* and *Bulletin* has been located at 3 Joy Street to synchronize the editorial and mechanical production of the magazines. The non-periodic publications of the Society are also supervised here.

In following up the earlier project of maintaining a card-index file on members, the Society since 1954 has collected data from members and nonmembers who have at any time been associated with the field of meteorology. This comprises a contribution toward a complete National Register of Scientific and Technical Personnel which was assembled by the National Science Foundation through the participating scientific societies. Information from meteorologists has been placed on punch cards, and statistical surveys from the data are published.

The physical growth of the headquarters has been constant. In 1947 the office of the treasurer was moved from Mr. Burhoe's home to 5 Joy Street, and in the following year Dr. Brooks transferred most of the AMS files, long at the Blue Hill Observatory of Harvard, to the new office. Only the Library remained at Blue Hill under Dr. Brooks supervision and this was finally removed in 1959, partly to Harvard, partly to the new AMS headquarters, and partly to other interested libraries.

The headquarters rapidly outgrew the top floor space at 5 Joy Street; much more spacious quarters were found at 3 Joy Street in July 1950. As activities mounted and membership grew, even this once commodious space became inadequate, and many alternatives for new locations were considered. By a bit of good chance and successful negotiation by the Executive Secretary and staff, the Bulfinch House Trustees, custodians of the historic house at 45 Beacon Street overlooking Boston Common, became convinced that the Society would make a suitable occupant, and transferred their property and endowment to the American Meteorological Society in 1958. Renovation of the building commenced in late 1958 with full occupancy assured by early 1960.

Publications

The *Bulletin of the American Meteorological Society* is the only publication which has appeared regularly throughout the 40-year history of the Society. Volume One published in 1920 contained a total of 174 pages in a rather small format measuring 6 × 9 inches. By 1938 the number of pages published had risen to 472, a high for the first 25-year period. During the war years the number of pages usually ran slightly in excess of 400; for the last year before the reorganization (1944) the number was 432.

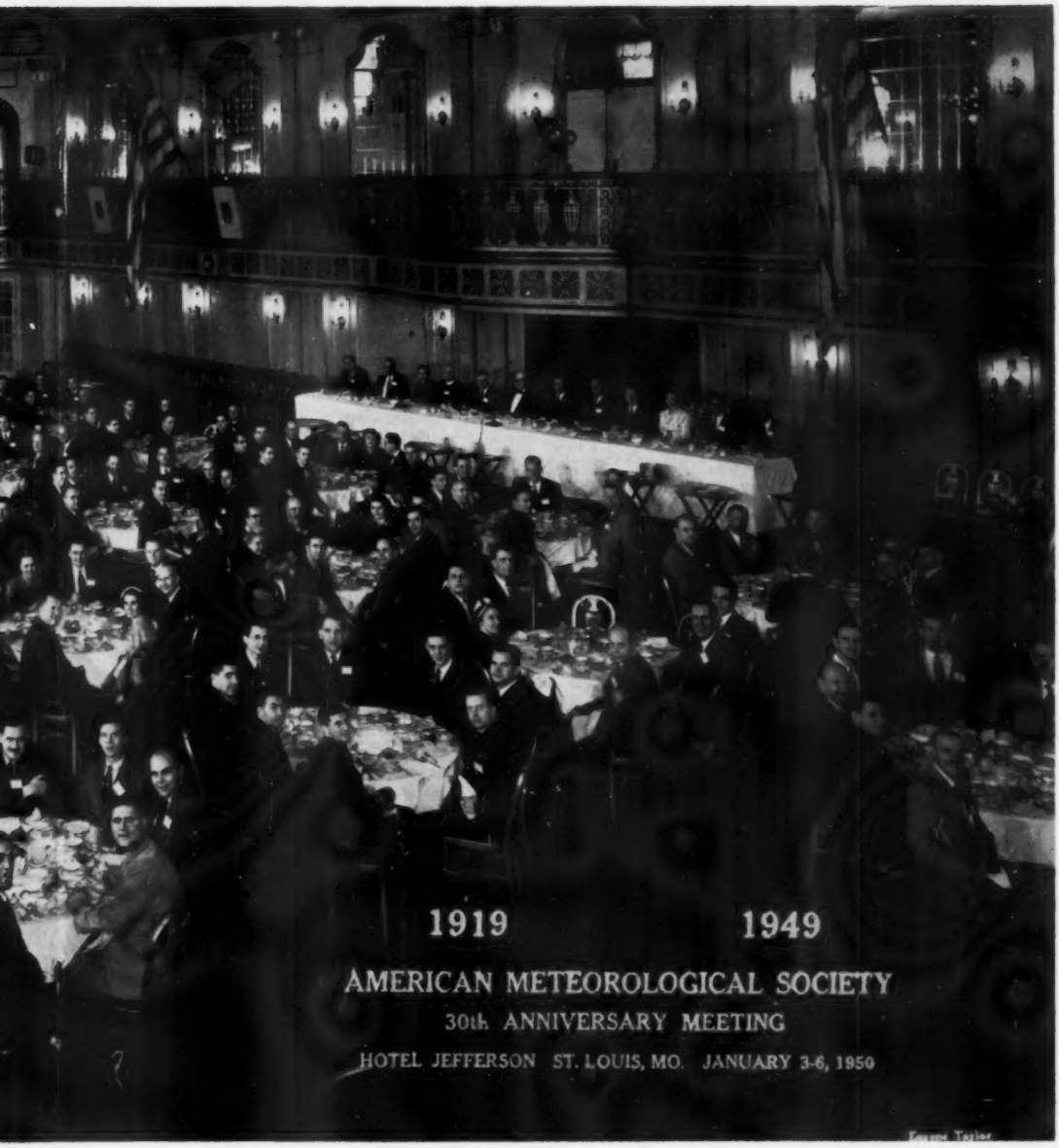
During the early years of the *Bulletin* its editor and guiding spirit always was Dr. Charles F. Brooks. In 1936 Robert G. Stone assumed the editorship of the *Bulletin* and carried the burden through two decades, much of the time with the assistance of his wife. During this period Mr. Stone was also engaged either as research fellow at Blue Hill Observatory or during the early war years at New York University, and since 1943 as advisor to the research executive of the Air Weather Service, U. S. Air Force.

In January 1949 under the leadership of President Howard T. Orville the *Bulletin* appeared in a new format in order to accommodate more material, to give greater space for charts and illustrations, and to attract more readers. The now familiar blue cover measures 7½ × 10¼ inches and presents a pleasing, modern appearance. Editor Stone relinquished full responsibility for the *Bulletin* at the conclusion of 1954, but continued as consultant through September 1955. Prof. William E. Hardy of Oklahoma A & M College carried the editorial tasks from January 1955 through August 1957. From that time to the present Editor Werner A. Baum and his associates at Florida State University have supervised all the technical articles, while the news sections have continued to be handled at the Society's headquarters at Boston. The 1959 volume of the *Bulletin* numbered 664 pages.

The first issue of the *Journal of Meteorology*, containing Nos. 1 & 2 combined, was dated September 1944 although it does not appear to have been mailed until later in the year. A second issue, Nos. 3 & 4, followed

American Meteorological Society

ociety—30th Anniversary Banquet



Prof. Sverre Petterssen, president 1958–59, addressing the National Meeting of the AMS in New York City, January 1958.

as of December to complete the first volume of 116 pages. Editor of the *Journal* during its first two years was Prof. Victor P. Starr of the University of Chicago. In following out a policy of rotating the editorship every two years, Dr. Robert B. Montgomery of the Woods Hole Oecanographic Institution took over for 1946–48. During Dr. Montgomery's regime, in 1947, the number of qualified papers presented for publication required the expansion of the magazine to six issues per year, a frequency which has been maintained through 1959. In 1947 the *Journal* published 209 pages.

At the commencement of 1948 the editorship returned to the University of Chicago where Dr. George W. Platzman assumed the duties throughout 1948 and 1949. A break in the tradition of transferring the editorship commenced in 1950 when Dr. Werner A. Baum, then head of the department of meteorology at Florida State University, and his associates assumed the editorial burden, and finding the task congenial, Dr. Baum has now carried the job through a full decade.

It should be pointed out that through a system of referees to evaluate the papers presented for publication many members of the AMS participate in the editorial task.

Since its first appearance the *Journal* has won international acclaim for its excellence. The increased productivity of research meteorologists can be judged by the increase in number of pages from 410 in 1950 to 698 in 1959, and even now there is an average time lag of 5 months between acceptance of a paper and its publication.

The need for a publication outlet for articles of greater length than could be accommodated in either of the Society's periodicals soon became apparent. In 1946 the Council authorized the institution of a series of *Meteorological Monographs* in a large format measuring $8\frac{1}{2} \times 11$ inches so that there might be adequate presentation of illustrative material. The very timely and successful first issue contained Dr. Woodrow Jacob's *Wartime Developments in Applied Climatology* (1947). The series has completed three volumes containing a total of 21 monographs. Dr. Wendell Hewson of the University of Michigan has served as editor of all the series so far published.

Since the reorganization of the Society in 1944 the Lancaster Press of Lancaster, Pennsylvania, has printed the *Journal of Meteorology, Bulletin, Meteorological Monographs,* and *Meteorological Abstracts.* It has just completed the *Glossary of Meteorology.* The unusually fine cooperation of Mr. Richard P. Rohrer, President, and Mr. Robert H. Mann has been a large contributing factor to the success of the Society's publication program.

Weatherwise

The publication of a magazine of attractive format which could carry articles in a popular style about the weather and the advancements in the science of meteorology had long been an objective of the Society. In the earliest days the *Bulletin* had served the layman with an interest in meteorology through the skillful editorship of Dr. Brooks. In 1946 the Society received an anonymous gift of $1,000 to explore the possibility of producing a popular magazine. A Committee of the Council reported later in the year that the required financial support for the venture was not in view.

The Amateur Weathermen of America was established at the Franklin Institute of Philadelphia in 1947 to assist in the formation of weather clubs and to stimulate the study of meteorology in elementary and high schools of the country. The publication of a popular

magazine formed a principal objective, and in February 1948, with 300 subscribers in sight, *Weatherwise* appeared, drawing on the energy and editorial know-how of Charles A. Federer, Jr., an AMS member and editor of the successful *Sky & Telescope* published at the Harvard College Observatory. During the first five years of *Weatherwise*, 1948–52, Mr. Federer, with the able assistance of his wife, took editorial matter gathered by David M. Ludlum of the Franklin Institute and made a readable editorial presentation. In these years Dr. Hans Neuberger of Pennsylvania State College bolstered the articles by careful technical supervision, and the drawings of Eric Sloane embellished the pages of many early issues.

The Council of the AMS, upon receipt of the first issue of the magazine, decided to expend the anonymous gift to offset part of the cost of distributing *Weatherwise* without charge to all members. The practice continued through the first half of 1949 when a momentary financial crisis required that henceforth *Weatherwise* be sold to members who desired it at a reduced rate. In 1952 with the reorganization of the membership structure *Weatherwise* became a regular publication of the Society, being distributed to all members. In 1949 the U. S. Weather Bureau purchased a sizable block of each issue of *Weatherwise* for distribution to selected cooperative observers, a practice which continues to the present.

At the commencement of 1952, the Amateur Weathermen of America being dissolved, many AWA members were absorbed into the AMS as associate members. At the conclusion of 1952 David Ludlum assumed full publishing and editorial control of *Weatherwise* and has since been ably assisted by Henry W. Bulkley, of the New York advertising firm of Robert Conahay Associates, who is responsible for the cover and layout of each issue. Since the February 1953 issue the manufacture of the magazine has been done at the Lancaster Press, Lancaster, Penna.

The first volume of *Weatherwise* in 1948 contained 116 pages, while the present volume, No. 12, will number a total of 256 pages.

The Society has also published several volumes of a miscellaneous classification. *Air Mass Analysis and Forecasting* by Jerome Namias, a good seller during the war years, was published in a Spanish edition in 1947 and distributed by Science Service. *Weather Horizons* in 1947 called attention of guidance counselors to the opportunities in meteorology and the available training schools and colleges. In cooperation with the Carnegie Institution of Washington the massive, 800-page *Dynamic Meteorology and Weather Forecasting* by C. L. Godske, T. Bergeron, J. Berknes, and R. C. Bundgaard was published in 1957. The proceedings of recent conferences on weather radar and applied meteorology have also been published by the Society. Probably the best-known publications of the Society have been the *Compendium of Meteorology* (1951) and the *Abstracts and Bibliography* (1950–), and these will be discussed in another paragraph.

Publishing Services

An arrangement with the U. S. Air Force became operative on 1 April 1948 through which the Society initiated a survey of present meteorological knowledge and an assessment of the future needs, following out an idea conceived by Colonel Ben Holzman, a councilor of the Society. This developed into the publication, *Compendium of Meteorology*, containing a series of 108 articles on many aspects of meteorology, each written by an expert in his field. Prof. Thomas F. Malone

Col. Arthur F. Merewether, U.S.A.F. ret., president 1954–55, currently Manager—Weather Service, American Airlines.

The late Prof. Rossby, in typical pose, instructs and amuses fellow AMS members. From left to right: Jerome Namias, Prof. Rossby, Prof. Horace R. Byers, Vernon Crudge, and Dr. Vincent Schafer.

of M.I.T. served as editor, and with the assistance of his committee the volume was planned and the articles assigned by January 1949. The 1,334-page volume appeared in the fall of 1951 and immediately won acclaim as a milestone in the history of meteorology. Frequent suggestions were made that there should be supplements, and in 1957 the Meteorological Research Reviews were published as Volume 3 in the *Monograph* series.

The need for bibliographical information in the atmospheric sciences has always been urgent. From September 1942 through December 1948, the *Bulletin* carried a section devoted to systematically-arranged and classified bibliographies and abstracts of recent literature. Though these proved very popular with members, they could not provide complete and prompt enough coverage or sufficient information to suit the rapidly-expanding needs of professional meteorologists of the Society. Malcolm Rigby in 1948 pointed out that only about ten per cent of the literature was receiving any systematic notice. The Executive Secretary, after a survey of possible financial support, proposed to the Council that the Society undertake an abstracting service. Accordingly, early in 1949 the Air Material Command of the U. S. Air Force concluded an arrangement with the Society for a publication service to examine, evaluate, catalog, abstract, and publish meteorological literature for the Geophysical Research Directorate of the Air Force. The AMS, in turn, would also make the published material available to the profession as a whole. An office in the Library of Congress in Washington opened in August 1949 with Malcoln Rigby, formerly of the Weather Bureau, serving as technical director and editor. *Meteorological Abstracts and Bibliography* appeared in January 1950 and has been issued 12 times per year ever since. It immediately won world-wide recognition for its excellence not only in meteorological circles but also in other scientific and bibliographical fields. Although the U. S. Air Force to date has been the major source of support, additional assistance at times has been received from the U. S. Navy, Signal Corps, Quartermaster Corps, Weather Bureau, Bureau of Standards, and Public Health Service.

An additional editorial project was undertaken for the Geophysical Research Directorate in 1952 with the purpose of making foreign language research reports and periodical articles quickly available to research workers. The translation staff has been located at the headquarters at 3 Joy Street where additional space was rented. Lists of translated material are available to all interested persons and copies of translations are exchanged with various agencies.

The *Weather Glossary*, published by the Weather Bureau in 1946, served a very useful purpose for a number of years, but

the accelerated advances in the science since World War II required a much more comprehensive publication. Again the Department of Defense, along with the Weather Bureau, came to the Society with a plan for producing the required publication. The project commenced in 1956 with offices in the Society's headquarters. The *Glossary of Meteorology* was begun under the editorship of Dr. James K. McGuire of the Weather Bureau with offices in the Society's headquarters. Most of the work has been pursued under the editorship of Ralph E. Huschke, and the volume was published in November 1959.

Professional Activities

President Rossby stressed the importance of broadening the base of support for American meteorology to include business and industry. In his June 1944 message to members he called on the Society "to assist and advise properly qualified individuals entering the field as private or consulting meteorologists," and he thought the Society "should within the limits of its resources, encourage sound and objective investigations in the field of economic meteorology through properly organized research projects." He called for a clear-cut policy for cooperation between Government and private consulting meteorologists "to serve transportation, industry, and agriculture effectively, in a fashion designed to supplement, rather than compete with, existing Government meteorological facilities."

Rossby proved indefatigable in promoting this interest by talks to business and educational groups, through reprints and general letters, and, most of all, through the personal warmth of his urging young meteorologists to broaden their scientific background so as to qualify for responsible positions both in meteorology and its related fields. President Houghton, upon assuming office in 1946, advised meteorologists to obtain positions in large industries or business and thus acquaint themselves at first hand with the problems of that activity, with a later view of serving several such concerns.

Two meetings in March 1946 were held in New York City and Boston between AMS officials and local leaders of business and industry who were known to have weather problems. Perhaps the most tangible contribution in this field concerned the "battle of the teletype" in which the AMS spearheaded the successful effort to free the weather teletype circuits from unduly restrictive Government regulations which tended to throttle rather than to encourage aspiring consultants in meteorology. Professional membership in the Society became the requisite qualification of applicants for teletype licenses.

The Society's activities in this field were placed on a permanent foundation on 18 July 1947 with the appointment of a Committee on Industrial, Business, and Agricultural Meteorology (CIBAM). Capt. H. T. Orville and Charles C. Bates served as chairmen during the early days. In addition to the teletype affair, probably the highlight of its work came at the 30th Anniversary Meeting at St. Louis when a Symposium on Trends and Progress in Applied Meteorology brought leaders of all fields into intimate discussion. A special issue of *Weatherwise* in 1953, devoted entirely to industrial meteorology, brought an acquaintance of the subject to a wide audience. In 1957 the first Conference on Applied Meteorology was held at Hartford, Connecticut, a second conference at Ann Arbor, Michigan, in 1958, and the third is scheduled for Santa Barbara in April 1960.

At the present time the AMS maintains two boards whose duties are to pass on the qualifications of those who go before the public with meteorological information and to maintain high professional standards. The Committee for Certified Consulting Meteorologists, at the present writing, has passed favorably on the application of 22 members. The Council of the Society will review by the end of the year a dozen or more applicants for the Seal of Approval for television and a smaller number for radio as recommended by the Board on Radio and Television Weathercasting.

The persistent growth of the field of industrial meteorology can perhaps best be traced by the stature of the Professional Directory which appears in each issue of the *Bulletin*. Commenced in 1948 with 6 listings, the Directory now contains 24 professional concerns which are competent to give meteorological advice.

Educational Services

There is no phase of the activities of the AMS which is not closely connected with education, either of the formal school type or in regard to the general public. The Society has always numbered a large percentage of its members among students and faculties of our universities. In fact, ten corporate members are universities. The publications of the Society enter practically all major schools in the country with a scientific interest. There are now a Committee on Meteorological Education (college and university) and a Schools Committee (secondary and elementary).

In 1953–54 two special issues of *Weatherwise* were published: one devoted to guidance material for those wishing to enter college for meteorological instruction, and the other to show what the high schools of the country were doing in meteorology. These were widely distributed in educational circles.

In 1956 the National Academy of Sciences established a Committee on Meteorology, and two years later a searching report was made public. The principal finding of the report concluded that the progress of meteorological research is inseparable from the problems of meteorological education and manpower. They recommended that research in existing universities be strengthened, that a new National Institute for Atmospheric Research be established, and that certain steps be taken to attract young scientists into the field.

The manpower problem was directed at the AMS for action. The first step in carrying out the Committee's recommendations saw the establishment of a Visiting Lecture Program in which colleges and universities over a wide geographical area were visited by professional meteorologists in this program supported by the National Science Foundation. The objectives of this program were to stimulate interest in meteorology among college students of the sciences, to attract scientists in other fields to interdisciplinary studies related to meteorology, and to acquaint the scientific community and the public with weather as a natural resource.

In the summer of 1959, the National Science Foundation sponsored the AMS-Loomis

The new headquarters building of the AMS at 45 Beacon Street overlooking Boston Common which will be occupied early in 1960.

School Atmospheric Sciences Program in which 30 outstanding high school juniors from all sections of the country came to Windsor, Connecticut, for an eight-weeks study program in various phases of meteorology. The success of this program has led to plans for holding three similar programs in the summer of 1960.

A full-scale attack on the future manpower program has been drawn up under the guidance of President Petterssen. Nine different programs have been outlined and submitted to the National Science Foundation—some of these are already in operation, others are awaiting approval:

1. *Career-guidance booklets.* Two such booklets will be developed, one for wide distribution to young students, and the other for the enlightenment of career-guidance counsellors, teachers and parents.

2. *Educational motion pictures.* In all, seven films will be developed. One of these will be of general interest and its production will be financed by private funds. The remaining six will be scaled to the needs of education and career development, and financial support for their production will be needed.

3. *Educational lantern slides.* It is proposed to develop a series of sets of educational meteorological slides supplemented with sound track and printed texts, mainly for use in high schools and colleges.

4. *Visiting lecturers (A).* A program will be operated to supply visiting lecturers to high schools to stimulate interest in atmospheric studies.

5. *Visiting lecturers (B).* A program will be operated to supply visiting lecturers to colleges to stimulate students in mathematics, physics, engineering, etc. to enter the field of atmospheric sciences.

6. *Visiting lecturers (C).* A program will be operated to arrange for outstanding foreign atmospheric scientists to give series of lectures in American universities to stimulate teaching and research on advanced subjects.

7. *Pre-college science centers.* It is proposed to establish summer courses in the general sciences with emphasis on atmospheric problems with programs designed to reach relatively small numbers of especially gifted students.

8. *Educational monographs.* About ten interest-stimulating monographs on atmospheric subjects will be produced. Close collaboration with the Physical Science Study Committee project will be sought.

9. *Interdisciplinary conferences.* A series of such conferences and symposia will be arranged to stimulate the interest of mathematicians, statisticians, physicists, chemists, etc., in the scientific problems of the atmosphere.

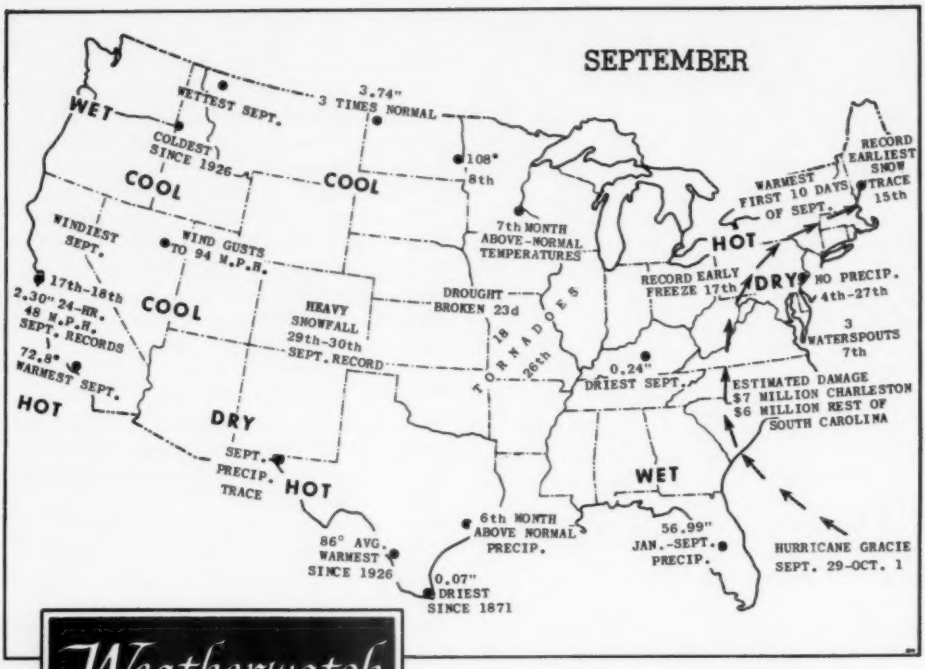
Proposals for all of the above projects except 9 have been submitted to the National Science Foundation, and are either under review or are being processed for grants. Funds to undertake projects 4 and 6 have already been received by the Society.

The AMS and the Public

The Council of the Society has followed a policy in the 1950's of issuing statements as to the status of present knowledge in certain fields of meteorology. It was felt that this was required in view of the increasing awareness of the general public that weather phenomena affects all aspects of human endeavor and to counteract certain popular misconceptions which had grown up concerning the present capabilities of the science. Based on expert opinion, statements of general interest have been issued concerning the present status of forecasting, weather modification, tornadoes and their detection, solar influences on weather, present research programs, and hurricane study.

In addition to these formal statements, the Society headquarters has made many publicity releases concerning current activities in the field of meteorology. The distribution list is broad in coverage, including key meteorological centers of Government, universities, industries, newspapers and magazines, radio and television. These assist in answering some of the several thousand questions which are directed to the Society each year from the general public.

All of the activities mentioned in these pages are directed toward carrying out the fundamental aims of the Society stated 40 years ago: "The development and dissemination of knowledge of meteorology in all its phases and applications, and the advancement of its professional ideals." Let us hope that the next decade will see the Society continue and expand its influence in this field so vital to the Nation's welfare.



Data by Office of Climatology, USWB.

September and October Contrasts

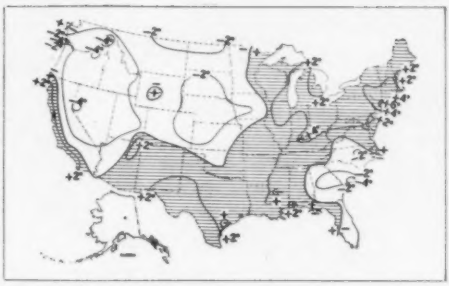
DAVID M. LUDLUM, *Editor*

CIRCULATION—The air flow pattern across the nation in September divides rather conveniently into three distinctive periods of about ten days duration each. The first ten days were notably warm, a continuation of the hot weather of August, over all of the country with the usual exception of the Northwest where a stronger than normal westerly flow provided cool air. A western ridge-central trough-eastern ridge combination provided most of the western part of the country with a fast flow from west or west-southwest and the easterly sections with a southwest or south flow, a direction favorable to late summer heat waves.

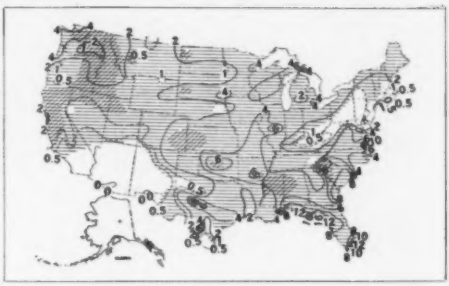
In the South, the first nine days of the month at El Paso, Texas, were the warmest such period ever experienced with the mercury reaching 100° on four of the nine days. In the North, at Bismarck, North Dakota, the maximum on the 8th of 105° marked the warmest ever registered so late in the season. In the East, Buffalo, New York, had its warmest early September day with 95° also on the 8th.

The second decade brought a completely different pressure situation as a great Canadian anticyclone built eastward and southward on the 9th and 10th to dominate completely the air traffic across the country. A massive ridge line rose along the 105° W meridian, roughly close to the crest of the Rockies, extending from the deserts of Mexico to the Arctic. This turned air flow over central and eastern United States into the northwest and north. After weeks and weeks of excessive heat, the mercury plunged to far below normal figures; for the week ending 21 September, the average ran −6 degrees in North Dakota, −9 in Michigan, −12 in northern New York and New England, −9 in Virginia, and −3 in Florida. Another influence of the great anticyclone pushed all storm activity off the continent except for the central and northern Pacific Coast where the blocking action of the ridge to the east contributed to the creation of an unusually early winter-type storm in northern California.

By the 19th the ridge line had moved eastward to the Atlantic Coast where it merged with the Bermuda high to form a strong ridge offshore. The familiar pattern of the past summer—a western trough and eastern ridge—again appeared on the circulation charts. The westerlies picked up speed so the pressure troughs could once again move eastward without hindrance. One trough entered the Northwest on the 23rd, quickly pushed into the cen-



Departure of Average Temperature from normal in degrees Fahrenheit. USWB chart.



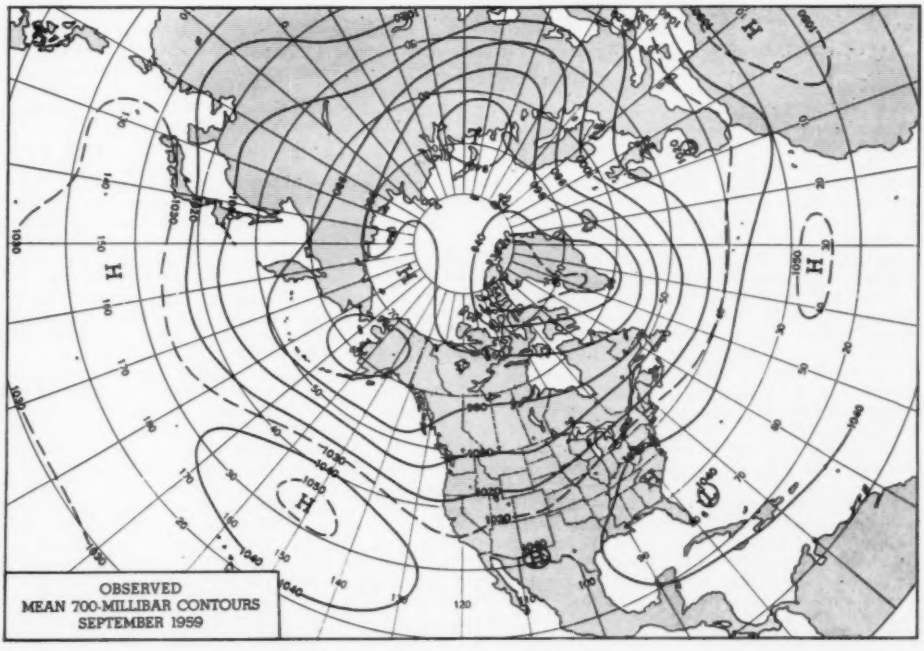
Total Precipitation in inches. USWB chart.

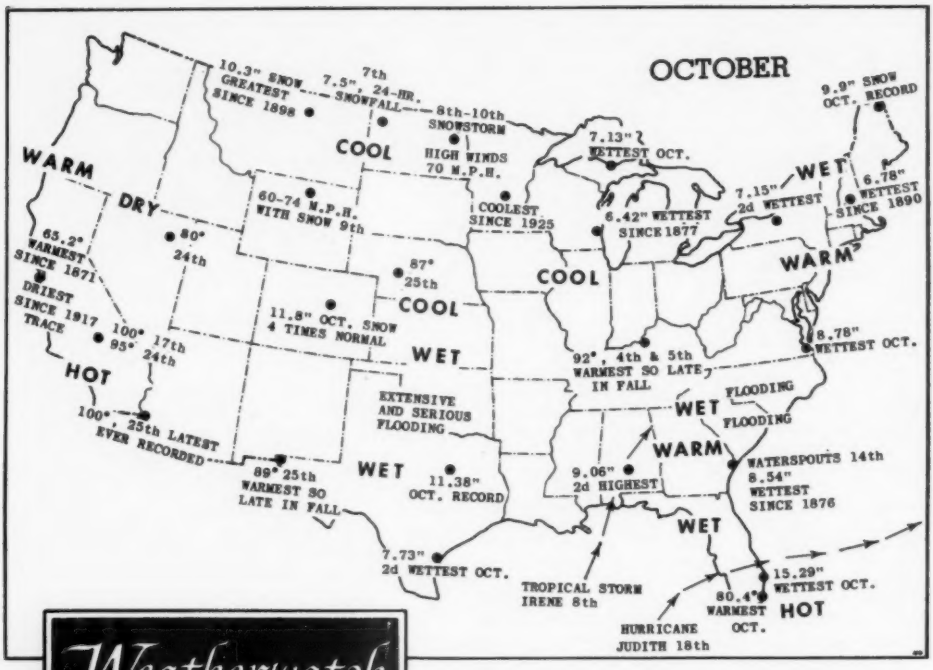
tral Plains, and developed a major storm situation early on the 25th as a deep north-south trough occupied the entire Plains area with one center in North Dakota and a second in Oklahoma. Both possessed great energy as they moved north-northeastward causing heavy rains, severe local wind storms, and a series of small tornadoes in their wakes. On the rear side of these depressions, cold air, drawn far southward over the central and southern Rockies, created a record snow situation for September in Colorado east of the Great Divide.

While the storms over the Plains were whirling slowly northeastward into Canada, Hurricane Gracie marked time north of the Bahamas awaiting an invitation to move. As the blocking anticyclone to the north relaxed and the central trough pushed eastward, Gracie edged closer to the mainland on the 28–29th. Once in the influence of the fast southwesterly flow on the eastern side of the trough, Gracie moved inland over South Carolina and then swept northward along the eastern slope of the Appalachians until the steering current carried the diminishing storm eastward across central New England.

(*Continued on page 251*)

The upper-air map below shows the pattern of air flow for September at about 10,000 feet, on which the average weather largely depends. The contours lines represent the mean height of the 700 mb. pressure level. Figures are in tens of feet: 1020 = 10,200 ft., 980 = 9,800 ft., etc. Chart by Extended Forecast Section, USWB.





Weatherwatch

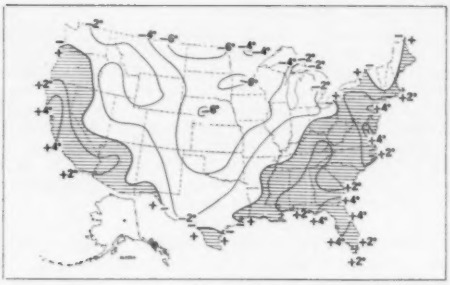
CIRCULATION—The month of October, as if to give a key to its character, opened with a marked cyclonic circulation over the Southwestern States and closed with a second such feature dominating the weather maps. Although the previous month had exhibited striking changes from week to week in circulation pattern, with a period of anticyclonic dominance sandwiched in between two spells of westerly control, all of the October weather charts wore much the same face—ridge conditions predominating over the Western States, a persistent trough covering central sections, and a ridge off the Atlantic Coast joining the Bermuda high.

Cyclonic activity dominated the October scene from start to finish. The upper-air circulation charts showed a long wave in the westerlies. The principal feature affecting North American weather lay in a much deeper than normal mean low pressure area close to the tip of the Aleutian Islands of Alaska. Pressure impulses moved northeastward across southern Alaska and the Canadian Rockies; then, having regenerated as depressions of the Alberta type, moved southeastward into the trough over central United States.

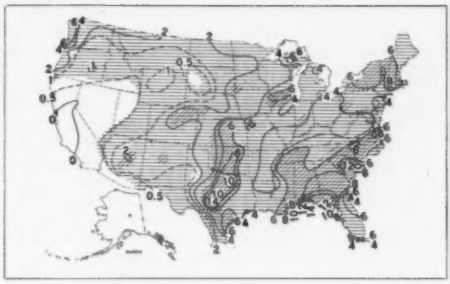
The principal jet stream at the 10,000-ft. level also headed eastward for the same cyclonic area after entering the continent over Oregon. Upon reaching the South Dakota-Minnesota trough the jet turned northeastward to guide the month's principal storm track over Lake Superior and across southeastern Canada. The storm track crossroads in the upper Mississippi Valley provided the seat of the greatest minus pressure departures, as barometers everywhere between the Appalachians and the Rockies averaged below normal. Two intense storms of the Alberta type developed near-blizzard conditions on the 7–8th and 10–11th, and another storm period from the 21st to 27th produced a severe Lakes storm on the 24th.

An important sub-center of low pressure in the Gulf of Mexico provided a breeding place for three tropical storms, one developing hurricane force, and all being excellent rain producers. The cyclonic circulation in the Gulf also supplied a constant source of moisture for storm activity farther north over the continent. Still another low pressure feature, mentioned above, hovered over the Southwest on the 1st to 5th and reappeared again on the 28th to set up two spectacular storm scenes.

A persistent central trough feature usually results in much rainfall over the eastern two-thirds of the country from the clash of northwesterly streams of cold air rushing into the trough at the same time that warm air is pushing up the eastern slope of the trough. This October proved a very wet month in parts of the Southwest, in all the southern Plains, in the entire Southeast except eastern and southern Florida, and in the highlands of New York and New England. Rainfall amounted to more than 400 per cent of normal in central Arizona, north-central Texas, and the southern Appalachians. Floods struck northeastern Texas and Oklahoma, the rivers draining the southern Appalachians, and some northern New England streams. On the other hand, under



Departure of Average Temperature from normal in degrees Fahrenheit. USWB chart.

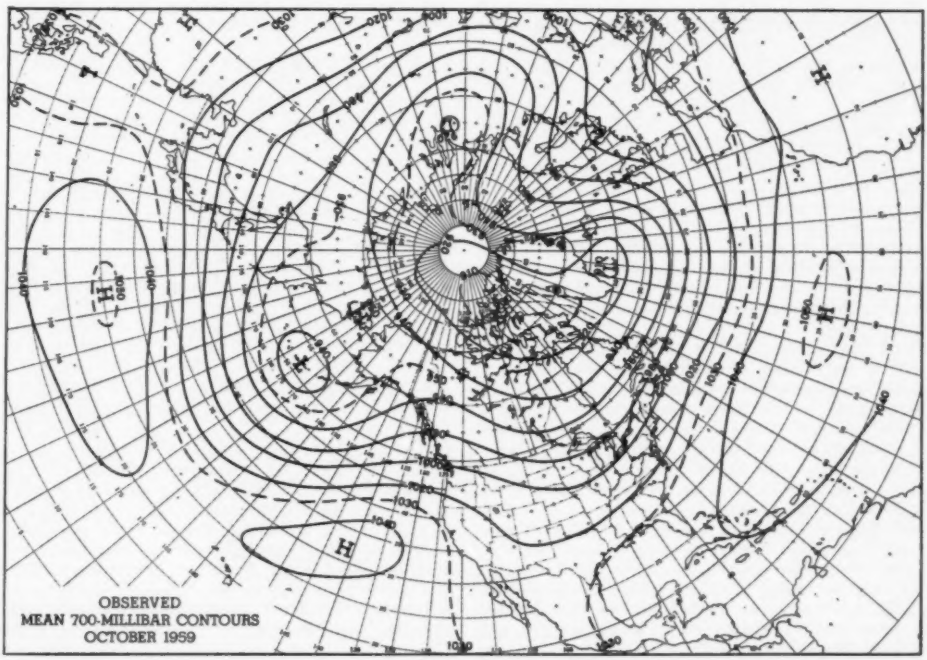


Total Precipitation in inches. USWB chart.

persistent ridge conditions, no measurable precipitation fell in central California and the figure reached only 25 per cent of normal over the rest of California and Nevada. Ironically, in central California October 1959 was the driest ever recorded and followed on the heels of the wettest September.

DULL OCTOBER IN SOUTHEAST—No less than six depressions, all good rain producers, crossed the Southeastern States during an October outstanding in cloudiness and wet conditions, just the reversal of the usual bright October sunshine. Three storms originated as waves in the Gulf of Mexico, and three others which formed in the lower Mississippi Valley trailed fronts across the Gulf as they moved eastward. The unusual cyclonic activity at the southern end of the main trough of the month encouraged tropical air masses, laden with heat and moisture, to move northward, covering the Southeast with mid-summer conditions and preventing the usual intrusions of frosty air from the North. The persistence of these frontal systems is well illustrated by the presence of fronts over some part of Florida on every day from the 14th to the 25th and from the 27th to the 31st.

In Georgia at Augusta, where President Eisenhower spent a golfing vacation, the rainfall of 6.90″ exceeded any October total since 1929 and daytime cloudiness amounted to 74% of possible. Atlanta's possible percentage of sunshine, 40%, was the lowest of record for the month. Macon had its wettest October of record; at Savannah it ranked second. At Montgomery, Alabama, the rainfall was the second highest in the 88-year record, exceeded only by 1879.



OBSERVED
MEAN 700-MILLIBAR CONTOURS
OCTOBER 1959

The wet belt extended northward into the Carolinas where Piedmont and mountain locations had a very wet time. Farm work throughout the area was greatly hampered after the first week by wet fields and persistent cloudiness which slowed drying.

The two chief rain-producers for the Florida peninsula were of tropical origin, moving from the vicinity of the Yucatan Peninsula northeastward into the eastern Gulf and then almost directly eastward across Florida and continuing eastward without recurving along latitude 30° N far out into the Atlantic Ocean in the strong west-southwest flow aloft. Hurricane Judith came ashore just north of Ft. Myers on the morning of the 18th. Fastest mile of wind 40 mph from the south-southwest—lowest pressure 29.57″ (1001 mb)—24-hour rainfall 7.57″ on 17–18th. A few trees were blown down, some beach erosion occurred, and the heavy rains damaged crops. Judith continued across the peninsula to Vero Beach, producing heavy rains but nothing exceeding a gale. A second tropical disturbance soon generated in the same area, moving on a track about 225 miles farther north than Judith, and also proved an excellent rain-producer with the highest totals this time falling on the east coast: Palm Beach had 6.37″ in 24 hours on the 19–20th.

The almost continual presence of Gulf air over much of the Southeast kept temperatures well above normal. A band across the central and northern portions of the Florida peninsula averaged four degrees above normal. At Tampa it was the second warmest October in records dating back to 1890 with only two days below normal. The 90°-mark was reached on 13 of the first 16 days of October, with a peak reading of 94° on the 3rd. As late as the 30th a 93° reading at Lakeland set a highest-so-late-in-the-season mark. The same place also had its highest ever in October with 94° on the 3rd.

EARLY WINTER ON THE PLAINS—The heavy snowstorm over the eastern slopes of the Rockies on the last days of September continued into October to give the Plains and Midwest a preview of things to come. The weatherman at Green Bay described October as "a cold, damp, dreary month. It was more like our November, or even December."

The upper-air trough which persisted over the upper Mississippi Valley and southern Plains most of the month produced several active winter storms of the Alberta type which deepened considerably in their southeastward journey to the trough. Two storms swept the Dakotas in rapid succession on the 7–8th and on the 10th. Devil's Lake in northeastern North Dakota had a 5.0″ snowfall on the 8th and another of 5.7″ on the 10th. The second produced near-blizzard driving conditions in the open country as a 35-mile wind out of the northwest picked up loose snow and drove it along parallel to the ground. Temperatures dropped to the 20° range as an aftermath of the storm. It was the snowiest October of record and the coldest since 1925 at Devil's Lake. Williston at the northwestern corner of the state had 7.5″ in the first storm, the greatest early season fall of record.

A third major storm moved straight southeastward from Alberta on the 25–26th without recurving northeastward, dropping a light early season snow as far south as Illinois and Iowa. Finally, a repetition of the late September storm spread another blanket of snow over the eastern slopes of the Rockies and western Plains on the 29–31st of October. Denver had a fall of 7.4″, Lander, Wyoming, 8.7″, and North Platte, Nebraska, 5.8″.

Temperatures averaged below normal in a great triangular slice of the country extending from Washington southeastward to Texas and northeastward to the Lower Lakes. In some areas the averages ran as much as six degrees below normal. The coldest period came just before mid-month. At Minot, North Dakota, the mercury remained continually below freezing from the 8th to the 13th, but the lowest mark of 15° was well above the absolute lowest for October in that section.

CANYON WINDS IN UTAH—The northeastern corner of Utah in the Ogden area had a spectacular outbreak of its famed canyon winds on 30 October when an easterly flow rushed out of the westward-facing mountain passes at speeds estimated in the vicinity of 100 mph. Several million dollars loss occurred along the western slopes of the northern Wasatch Mountains as trees and poles were down and many structures damaged. These winds are essentially a mountain type air flow similar to the famed Bora of the Adriatic Coast of Yugoslavia.

On the 29th a large high pressure area built up from the State of Washington with a main axis extending eastward to the Dakotas. By the 30th pressure over Wyoming had built up to 1032 mb (30.48″), while a low over central Arizona had deepened to 1004 mb (29.65″). Southeastern Colorado had a pressure gradient of 16 mb (0.53″) in 200 miles. With a vast easterly circulation set up, cold air rushed from the mountain and plateau areas of Wyoming and Colorado through the passes of the Wasatch to descend on the plains with hurricane force. Similar situations can occur at a number of other points in the western mountain country, but the presence of a populous area, such as Ogden, at the mouth of the Utah canyons often causes unusual damage and distress.

ECLIPSE WEATHER—Our eclipse correspondent, Dr. Jack Stewart, writes that "the eclipse weather on 2 October in New England was very disappointing. The remnants of Hurricane Gracie moved through southern Vermont and New Hampshire during the early evening of 1 October, giving cloudiness and rain to the whole area. Although the associated cold front had passed Boston before 2300, the following continental polar air mass unfortunately contained a great deal of moisture, and at sunrise the entire track of totality was still heavily overcast, even though Gracie and the front were by then more than 200 miles offshore. Drizzle was falling along the coast, wetting down the many observers who had assembled there." Dr. Stewart and his father viewed the event from a cow pasture near Nashua, New Hampshire. Though the rising sun was completely obscured by clouds, they did observe a brilliant red strip on the western horizon where the sky was clear. These observations will be embodied in a future article in *Weatherwise*.

Sky and Telescope magazine reported that no ground observer in New England obtained a completely clear view of the rising sun during the moment of totality. Several aircraft flights succeeded in viewing and photographing the phenomena in all its glory. One small plane luckily struck a cloud street at 6,500 ft. with a clear view of the sun, while a commercial airliner at 21,000 ft. observed both the eclipse and interesting coronal light reflected from the clouds.

September (*Continued from page 247*)

WINTER'S ADVENT—The first large Canadian anticyclone of the season which carries frigid blasts and freezing temperatures into the Northern States always arouses much attention from the public each year. In 1959 this event was especially welcome since the latter part of the summer had been unusually warm with nighttime temperatures reminiscent of mid-July prevailing well into the first ten days of September. The summer pattern of west-southwest flow commenced to change on the 10th as a large ridge built up over the interior of western North America, stretching from the desert Southwest to the Canadian tundra.

By the 11th a massive Canadian anticyclone, centered in the vicinity of Great Slave Lake in the Northwest Territories, showed a central pressure of 1032 mb (30.48″). The cold air forming the core of the high pressure mass remained north of the United States border for the next three days, contained there by a strong flow of westerlies across northern and central U. S. Central pressure of the high continued to increase to a peak of 1040 mb (30.70″), all the while remaining in the sub-Arctic.

Meantime a very active circulation over eastern Canada developed as a low just off the Labrador Coast, feeding on the cold air out of the Arctic, bored in with the pressure dropping to 972 mb (28.70″). The Labrador low guided the cold air flow eastward so that in its first phase the Canadian air mass hardly penetrated south of the Upper Lakes. On the 13th International Falls, Minnesota, had a maximum of 64°, while Fargo, North Dakota, only 180 miles southwest, reported a mild 85°. Further east the cold air was able to flow southeasterly more freely and descended on upper New York and northern New England in the sweep of the circulation around the deep Labrador low. Mt. Washington, N. H., had its first substantial snowfall on the early morning of the 15th as 4 inches covered the 6262-ft. elevation and a minimum of 19° was registered that day. The snow showers reached down to the seacoast where Portland, Maine, experienced its earliest observed fall of snow in the early morning hours of the 15th, though the minimum temperature that day dropped to only 41°.

The second and main phase of the cold air penetration did not move out of the source region in Canada until an upper-air trough deepened over the Mississippi Valley on the 14–15th and drew the cold air into its rear. Pierre, South Dakota, had a maximum of 92° on the 14th, but reached only 58° the next day. Nighttime temperatures on the 17th and 18th, with clear skies attending the center of the large anticyclone, reached very low figures for so early in the season: Tamarac, Minn., 17°, Pellston, Mich., 25°, and Saratoga, Iowa, 29°—frosts occurred generally southward to Iowa and eastward through the northern Ohio Valley. At Bowman, N. D., two inches of snow fell on the 16th.

As the anticyclone drifted eastward on the 18–20th low readings occurred throughout the East. Olean, New York, dropped to 18°. Philipsburg, high astride the Pennsylvania mountains, had three consecutive nights with 25° to 26° minima.

The cold front pushed southward along the Atlantic Coast on the 17th and 18th, reaching northern Florida on the 18th and finally passing Miami early on the 20th. Minimum temperatures in the Carolina coastal area dropped to the 50's for the first cool night of the fall, and below 70° in northern Florida and Georgia.

TWO CALIFORNIA EVENTS—Coastal Southern California had the season's most spectacular heat flash on September 11th. Though the preceding and following days had normal temperatures, the mercury at Los Angeles Airport, close to the ocean, soared to 103° on the afternoon of the 11th, while southward at San Diego a peak of 102° represented the 4th highest maxima for any day since 1872. The southern San Joaquin Valley also had a hot day, but not extreme. A tropical storm moving northward over Lower California had set up an easterly circulation aloft in its advance, bringing hot air from the deserts of northern Mexico over the interior mountains and down to the coastal plain. In its descent this air, originally very warm, was still further heated dynamically in its descent to the California cities.

An unusually early and precipitate end to the long dry season occurred in mid-September as an out-of-season, winter-type storm moved inland over central and northern California on the 17–19th. A North Pacific low, forced southeastward by the blocking effect of high pressure over central Canada, pushed a vigorous front inland on the 18th. Rain was particularly heavy in the central coastal area northeastward through the Sacramento Valley where records for amounts and intensity for September were approached. The wind at Sacramento mounted to 46 mph, the highest ever recorded there in the month of September. At Oakland the 3.23″ in 24 hours set a 30-year record. Historically only the September 1904 storm could match the rain and wind of September 1959's disturbance.

HURRICANE GRACIE—A suspicious circulation in an easterly wave appeared on the weather charts for 21 September between the eastern end of Cuba and the southeastern Bahama Islands. During the next days the area moved in a S-curve to a position 300 miles east of Cape Canaveral, Florida, by the 25th, but the following three days saw little forward progress as the center engaged in a hesitating easterly loop. But early on the 28th the storm, now hurricane Gracie, took off determinedly on a northwesterly course toward the Carolina-Georgia coast.

In his monthly summary for September, the Charleston weatherman tersely described Gracie's local effects:

Hurricane Gracie, the most severe storm thus far this season, struck the Charleston area with hurricane force winds on the morning of the 29th. The center of the storm moved inland over St. Helena Sound (40 miles southwest of here) just before noon with the eye extending up to about Jenny Inlet. Trees were uprooted all over the city, roof damage was extensive and numerous plate glass windows were destroyed. Roofs and sides of boat sheds at the Municipal Yacht Basin were ripped off but with very little damage to the boats in the basin. One boat was sunk in the Stono River. Warnings were well heeded and no lives were lost. Power was off over the entire city for one to ten days and telephones were mostly inoperative. Striking at low water the storm produced tides at that time from approximately 8.6 feet above mean low water at the Custom House to approximately 9.7 feet in the lower section of the city. The low areas were flooded by from one to two feet of salt water. September was rainy, the city had the most number of days with 0.01 inches or more for September since 1928. A new record low September pressure (29.16″

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—987.5 mb) was established during the passage of the hurricane, and a new record wind speed for September could well have been established for at 0647 when the current went off a fast mile of 48 mph from the NE was recorded.

Further north at Wilmington, near Cape Fear, the peak wind gust came out of the southeast at 67 mph, while the fastest mile from the same direction reached only 43 mph. These occurred at 1400 on the 29th. Rainfall during the entire storm period amounted to only 1.39″ and tides ran 2 to 5 feet above normal. At Cape Hatteras, farther north, the peak wind was 32 mph.

To the south of the landfall, at Savannah, wind speeds were estimated at 75 mph in gusts with a measured mile at 56 mph, equaling the September maximum wind record there. Lowest pressure was 29.27″, and rainfall totaled 3.94″ in a 16-hour rain period.

As the center continued its northwesterly curve after crossing the coastline, winds of whole gale force and torrential rains swept central South Carolina. Columbia, just to the east of the track, experienced extensive damage to trees, roofs, plate glass windows, and disruptions in utility services lasting up to 24 hours. The lowest barometer reading at the South Carolina capital was down to 29.11″, a mark equal to the third lowest in local records which extend back to 1887.

As the center turned northward along the slopes of the interior mountains, torrential rains fell over all the eastern ridges of the Appalachians. Northwest of Columbia rains from 7 to 8 inches were measured, and further north in western Virginia amounts rose to 9 inches with considerable flooding.

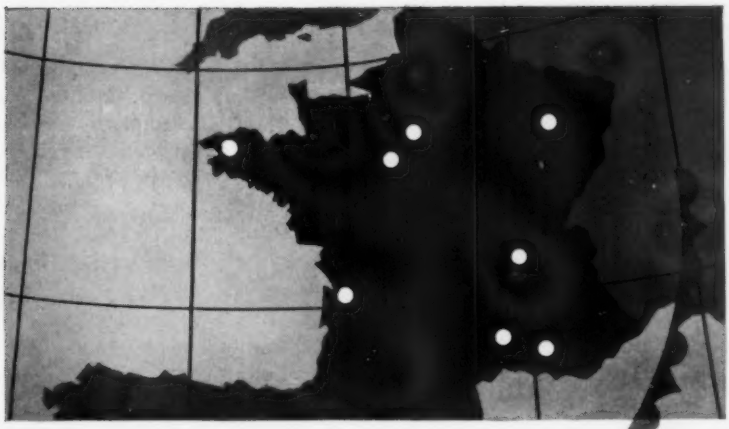
Gracie continued north over western North Carolina and West Virginia, then curved northeastward over Pennsylvania, and crossed New England on an easterly track, leaving the coast just north of Boston about sundown of October 1st. Everywhere to the west and north of the track rainfall was heavy with local flooding. The situation, however, failed to approach in intensity the somewhat similar pattern of Connie and Diane in the late summer of 1955.

INDEX

A full index to Vols. 11–12, 1958–59, of *Weatherwise* has been printed and distributed to all members of the AMS. Others who wish a copy may secure one without charge from the American Meteorological Society, 3 Joy Street, Boston 8, Massachusetts.

A previous index, issued in 1958, covered Vols. 1–10, 1948–57. Copies of this 20-page publication may also be secured without charge from the AMS.

An index will be issued at the conclusion of every two volumes (two years) hereafter. All indices have been prepared by Mr. A. R. Gordon, Jr. and Mr. L. B. Law, both of the U. S. Navy Hydrographic Office. We wish to offer them *Weatherwise's* eternal thanks.



28 DECCA RADARS

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NEW YORK MEETING

The AMS will hold a joint session with the Institute of Aeronautical Sciences on Monday, 25 January 1960, in New York City at the Hotel Astor. The joint session with the IAS is an annual fixture on the AMS calendar, but will stand alone this year since the usual AMS New York meeting is being replaced by the celebration of the 40th Anniversary at Boston.

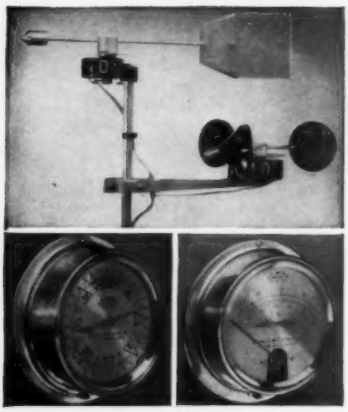
The morning session will be devoted to "Results of Recent Studies of Severe Storms." Four papers have been arranged by Dr. Louis Battan, chairman, Committee on Severe Storms of the AMS.

The subject of the five afternoon papers will be "Extensions of Upper Atmosphere Research with Rockets and Satellites." Dr. W. W. Kellogg of the Rand Corporation has arranged the program. AMS President Petterssen will serve as chairman of the sessions.

FORD FOUNDATION

In an effort to increase the number of advanced research scientists in the fields of meteorology and oceanography, the Ford Foundation recently announced the grant of almost $1 million to the following institutions: California Institute of Technology, University of California (La Jolla), University of Chicago, University of Colorado, Harvard University, Massachusetts Institute of Technology, University of Minnesota, and University of Wisconsin.

The grants are designed to build graduate ranks in these fields by recruiting undergraduate majors in science and mathematics and to enlarge opportunities for work to and beyond the Ph.D. level. About one-quarter of the grants are earmarked for visiting professorships and addition to faculties. All grants will be dispersed by the institutions above named, and applicants should apply to these.



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